

REMARKS

The Examiner is thanked for the thorough examination of the present application. The Office Action, however, has continued to reject all claims. Specifically, the Office Action has now rejected claims 1, 3-5, 6, 8-10, 12-15, and 17-19 under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. patent 6,708,251 to Boyle. The Office Action has rejected the remaining claims (claims 11 and 16) under 35 U.S.C. § 103(a) as allegedly unpatentable over Boyle in view of U.S. patent 4,894,770 to Ward. Applicants respectfully submit that the rejections be reconsidered and withdrawn for at least the reasons set forth herein.

In addition to the above-mentioned substantive rejections, the Office Action also rejected claims 1 and 3-5 under 35 U.S.C. § 112, second paragraph as allegedly indefinite, because the phrase "the I/O device" in line 4 lacked antecedent basis. Applicants have amended claim 1 to clarify the phrase as "the first I/O device." Accordingly, the rejection should be withdrawn.

Independent Claim 1 (and dependent claims 3-5)

Turning now to the substantive rejections, claim 1 (as amended) recites:

1. A method comprising:
determining at least one characteristic of a first input/output (I/O) device that is coupled to a memory device interface, the memory device interface being configured to enable data transfers between the first I/O device and a memory device;
buffering data corresponding to the first I/O device in a first portion of a buffer of the memory device interface, a size of the first portion being responsive to the at least one characteristic of the first I/O device;
determining at least one characteristic of a second I/O device that is coupled to the memory device interface; and

buffering data corresponding to the second I/O device in a second portion of the buffer, a size of the second portion being responsive to the at least one characteristic of the second I/O device.

(*Emphasis added.*) Claim 1 patently defines over the cited art for at least the reason that Steinbach fails to disclose the features emphasized above.

The Office Action cites element 22 of Boyle as being the first I/O device, and element 24 as being the second I/O device. In addition, the Office Action relies on column 3, lines 45-62 of Boyle as teaching the claimed features of “determining at least one characteristic of a first input/output (I/O) device” and “determining at least one characteristic of a second I/O device.” This portion of Boyle actually states:

The disk controller 80 is responsive to the host commands 72 to selectively allocate at least a portion of the buffer memory 40 for the audiovisual data 54. The disk controller 80 is further responsive to the host commands 72 to selectively transfer the audiovisual data 54 from the audiovisual interface 50 to the buffer memory 40. The disk controller 80 is further responsive to the host commands 72 to selectively transfer the audiovisual data 54 from the buffer memory 40 to the disk 30 to be stored. In the embodiment schematically illustrated in FIG. 1, the host command interface 70 is further adapted to receive second data 74 from the host system 20, and the disk controller 80 is further responsive to the host commands 72 to selectively allocate at least a portion of the buffer memory 40 for the second data 74, selectively transfer the second data 74 from the host command interface 70 to the buffer memory 40, and selectively transfer the second data 74 from the buffer memory 40 to the disk 30 to be stored.

As can be readily verified, neither reference number 22 or 24 (the alleged first and second I/O devices) are referenced in this portion of Boyle. Accordingly, this portion of Boyle cannot properly teach what the Office Action alleges it to teach.

More specifically, this portion of Boyle states that the disk controller is “responsive to host commands 72 to selectively allocate at least a portion of the buffer memory.” This is NOT the same as “determining at least one characteristic of a first I/O device...,” which Applicants have specifically claimed. Likewise, this portion of Boyle further states that “the disk controller 80 is

further responsive to the host commands 72 to selectively allocate at least a portion of the buffer memory 40 for the second data.” Again, this is not the same as “determining at least one characteristic of a second I/O device...,” which Applicants have specifically claimed.

Further still, in the cited portion of Boyle, the disk controller 80 is responsive to the same thing (i.e., host commands 72) for allocating both portions of the buffer memory. In contrast, claim 1 specifies that the respective sizes of the first and second portions of the buffer memory are “responsive to at least one characteristic” of the first and second I/O devices, respectively. Thus, claim 1 specifies two different criteria at being determined (i.e., a characteristic of the first I/O device and a characteristic of the second I/O device), which criteria are used to dictate the size of the first and second portions of the buffer for buffering the corresponding data.

In addition to the foregoing, the Office Action also cited column 7, lines 8-19 of Boyle as allegedly teaching the claimed features of determining characteristics of the first and second I/O devices. In fact, this portion of Boyle actually states:

In certain embodiments, the fractions of the buffer memory 40 allocated to the input audiovisual data portion 41 and the input second data portion 42 are dynamically adjusted to satisfy the memory requirements for the transfer of the data to the disk 30. For example, in instances where there is a large amount of audiovisual data 54 to be transferred from the audiovisual interface 50, but a relatively small amount of second data 74, the fraction of the buffer memory 40 allocated to the input audiovisual data portion 41 can be increased while the fraction of the buffer memory 40 allocated to the input second data portion 42 can be reduced.

Again, as can be readily verified, this cited teaching of Boyle does not teach the relevant claimed features. In this regard, while this portion of Boyle apparently teaches that the different portions of the buffer memory may be dynamically adjusted to satisfy the memory requirements for the transfer of the data to the disk, there is no teaching of determining characteristics of first and second I/O devices, which characteristics are used to dictate the size of the respective buffer portions.

For at least these reasons, the rejections of independent claim 1 are clearly misplaced, and the rejection of claim 1 should be withdrawn.

Claims 3-5 depend from claim 1, and therefore patently define over the cited art for at least the same reason.

Independent Claims 6, 10, 15, and 19 (and corresponding dependent claims)

Applicants respectfully submit that the rejections of claims 6, 10, 15, and 19 are improper, as the Office Action has failed to address these claims individually. Instead, the Office Action has rejected these claims in the same paragraph as claim 1 (paragraph spanning pages 2 and 3 of the Office Action). In this paragraph, the Office Action has quoted the language of claim 1, and has cited portions of Boyle that allegedly disclose those features (this rejection has been addressed above). However, the language of each of claims 6, 10, 15, and 19 is different than the language of claim 1, and it is improper to reject these claims under such a unitary rejection.

Stated another way, since Applicants have distinguished claim 1 over Boyle (above), that rejection should be withdrawn. Since the Office Action has not provided any separate rejection or additional analysis as to claims 6, 10, 15, and 19, the rejections of those claims should be similarly withdrawn.

Further still, each of independent claims 6, 10, 15, and 19 recite:

6. A method for allocating buffer capacity in a memory device interface that is configured to transfer data between an input/output (I/O) device and a memory device, the method comprising:
buffering data received via a first data transfer link in a first portion of a buffer of the memory device interface;
buffering data received via a second data transfer link in a second portion of the buffer, a buffering capacity of the first portion being different than a buffering capacity of the second portion; and
wherein the buffering capacity of the first portion is responsive to at least one characteristic of a first I/O device that provides data to the memory

device interface via the first data transfer link, and the buffering capacity of the second portion is responsive to at least one characteristic of a second I/O device that provides data to the memory device interface via the second data transfer link.

10. A memory device interface that is configured to enable data transfers between an input/output (I/O) device, the memory device interface comprising:
- a buffer;
 - a first plurality of registers that are configured to enable the memory device interface to buffer in a first portion of the buffer data corresponding to a first I/O device; and
 - a second plurality of registers that are configured to enable the memory device interface to buffer in a second portion of the buffer data corresponding to a second I/O device, a size of the first portion of the buffer being different than a size of the second portion of the buffer.*
15. A memory device interface comprising:
- a buffer;
 - a first plurality of registers that are configured to enable the memory device interface to buffer in a first portion of the buffer data received via a first data transfer link; and
 - a second plurality of registers that are configured to enable the memory device interface to buffer in a second portion of the buffer data received via a second data transfer link, a size of the first portion of the buffer being different than a size of the second portion of the buffer.*
19. A system comprising:
- means for determining at least one characteristic of a first input/output (I/O) device that is coupled to a memory device interface, the memory device interface being configured to enable data transfers between the I/O device and a memory device;
 - means for buffering data corresponding to the first I/O device in a first portion of a buffer of the memory device interface, a size of the first portion being responsive to the at least one characteristic of the first I/O device;
 - means for determining at least one characteristic of a second I/O device that is coupled to the memory device interface; and*
 - means for buffering data corresponding to the second I/O device in a second portion of the buffer, a size of the second portion being responsive to the at least one characteristic of the second I/O device.*

(*Emphasis added.*) Each of these claims patently defines over Boyle for at least the reason that

Boyle fails to disclose the features emphasized in those claims above. Furthermore, as the Office

Action has not specifically applied the teachings of Boyle to the language of these claims, Applicant submits that the outstanding rejections of these claims cannot be sustained.

Further still, with respect to claim 19, Applicant notes that the elements of claim 19 are set forth in means-plus-function format. Even though the elements may loosely correspond to the claim elements of claim 1, they cannot properly be construed coextensively. Instead, pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the elements recited in claim 20 are to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In Greenberg v. Ethicon Endo-Surgical Inc., 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means plus function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in Sage construed the relevant claim elements under 35 U.S.C. §

112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. Sage at p. 1428. The Federal Circuit further acknowledged this presumption in Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed as determined in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in In re Donaldson 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various means elements of claim 19 must be construed in accordance with the corresponding structure set forth in the present specification. In this regard, Applicants note that, in In re Donaldson, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations appearing in the specification are *not* to be read into the claims of an application.” In re Donaldson at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. In re Donaldson at 1848. Furthermore, the holding in In re Donaldson does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. In re Donaldson at 1850.

Accordingly, the fact that the Office Action appears to have construed the claim element of claim 19 to be co-extensive with the claim elements of claim 1 constitutes legal error. Simply stated, the rejection of claim 19 is erroneous, and must be withdrawn.

Claims 6-7 depend from independent claim 5, claims 11-14 depend from independent claim 10, and 16-18 depend from independent claim 15. As dependent claims include all of the features


of the base claims from which they depend, the rejection of dependent claims 6-7, 11-14, and 16-18 should be withdrawn for at least the same reasons as those advanced above in connection with the independent claims.

CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fees are believed to be due in connection with this amendment and response. If, however, any fees are deemed to be payable, you are hereby authorized to charge any such fees to Hewlett-Packard Company's deposit account No. 08-2025.

Respectfully submitted,



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